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# AN APPRAISAL OF THE **BOMBING OF**

**NORTH VIETNAM(U)** 

(THROUGH 22 AUGUST 1967) AUGUST 1967

S/2454/AP4A

Prepared Jointly by The Central Intelligence Agency and The Defense Intelligence Agency



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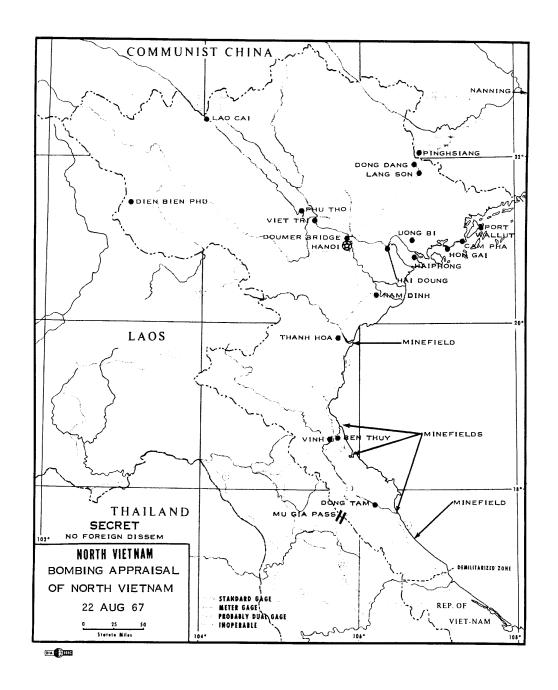
### AN APPRAISAL OF THE BOMBING OF NORTH VIETNAM

(THROUGH 22 AUGUST 1967)

#### **FOREWORD**

This report is prepared on a monthly basis at the request of the Secretary of Defense for an evaluation of certain effects of the ROLLING THUNDER program. The report covers three general areas of concern: Effects on Military Targets; Leadership and Public Reactions; and Effects on the NVN Economy. The discussion of political effects is limited to those developments within North Vietnam which relate to Hanoi's attitude toward continuing the war and the effects the ROLLING THUNDER attack has on civilian morale in North Vietnam.

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#### AN APPRAISAL OF THE BOMBING OF NORTH VIETNAM THROUGH 22 AUGUST 1967

#### SUMMARY

- 1. (S/NFD) Air activity over North Vietnam continued at a high level during the period, with most of the effort concentrated on the transport system, particularly the railroads. The most significant damage was inflicted when the Hanoi Railroad/Highway Bridge over the Red River (Doumer Bridge) and the bypass bridge over the Canal Des Rapides were interdicted. Damage to these facilities will seriously disrupt rail traffic from all northern lines and from Haiphong to Hanoi City and the whole country south of the Red River. The main highway routes linking Hanoi to Haiphong and the Chinese border also utilize these bridges. Essential military and economic traffic can be accommodated by alternate means until the bridges are repaired, but this will be difficult and costly.
- 2. (S/NFD) Destruction and damage of railroad freight cars and locomotives declined slightly from the June totals, but despite the heavy loss of railroad equipment, there continued to be no evidence of serious shortages. The number of vehicles reported destroyed and damaged during the period was one of the highest monthly totals since the beginning of the bombing. The preponderance of strikes and damage to vehicles occurred in the Panhandle south of the 20° Parallel. Damage to watercraft declined for the second consecutive month but still continued at a high level.

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- 3. (S/NFD) About 80 per cent of the total electric generating capacity of the country remains out of operation. A restrike on the Hanoi power plant caused additional damage, and it will require about one week to restore the plant to one-half of its installed capacity. Industrial production in the major cities has been disrupted by power shortages, bomb damage and the dispersal of manufacturing facilities.
- 4. (S/NFD) The food situation in North Vietnam has been temporarily improved by the rice crop harvested in June and July, although the long-run outlook still remains bleak. This rice crop is tentatively estimated at about 200,000 metric tons below the average of recent years. It is too early to evaluate the final prospects of the rice crop to be harvested in October and November, but the crop already has suffered from drought during transplanting in July and undoubtedly will continue to suffer from the effects of the bombing.
- 5. (S/NFD) There continue to be no signs of open disaffection with the regime, nor has there been any indication that the regime is modifying its policies in response to any popular unrest.
- 6. (S/NFD) Attacks against key facilities on the LOCs have created major problems in distribution of military and economic supplies. Disruption and dislocation of normal transportation patterns have caused additional delays and greater use of less efficient modes of transport. However, the North Vietnamese still retain the capability to support activities in South Vietnam and Laos at present or increased combat levels and force structures.

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#### Effects on Military Targets

- 1. (S/NFD) Air activity over North Vietnam continued at a high level during the period, with most of the effort concentrated on the transport system, particularly the railroads. Strikes on highway and waterway targets decreased, but those against rail targets continued at the high rate registered in June. The most significant damage was inflicted on key railroad/highway bridges. Damage to vehicles reached a near record high, while damage reported to railroad rolling stock and watercraft decreased. Jet-supporting airfields, military barracks, electric-power facilities, storage sites, surface-to-air (SAM) missile installations, and ammunition depots were also hit.
- 2. (S/NFD) Air strikes against several key railroad/highway bridges seriously affected the ability of the North Vietnamese transport system to move supplies. On 11 August, the Hanoi Railroad/ Highway Bridge over the Red River (Doumer Bridge) was interdicted. Damage to this facility -- North Vietnam's longest and most important bridge -- will seriously disrupt rail traffic from all northern lines to Hanoi City and the whole country south of the Red River. Supplies moving by rail through Haiphong, Dong Dang, and Lao Cai normally funnel over this key bridge to Hanoi and the south. The main highway routes linking Hanoi to Haiphong and the Chinese border also utilize this bridge.

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- 3. (S/NFD) A rail ferry site three miles south of the Doumer Bridge now provides the only rail alternate to the interdicted bridge, but MK 36 influence bombs in the area will undoubtedly disrupt traffic using this bypass. In addition to the rail ferry, three vehicle ferry slips and one highway pontoon bridge are available near the Doumer Bridge, and the Red River can be used to transship some supplies by watercraft. Based on the current estimate of damage to the Doumer Bridge, it will not be possible to resume rail service over it, even with only temporary repairs, for at least three weeks. Essential military and economic traffic can be accommodated by alternate means until the bridges are repaired, but this will be difficult and costly.
- 4. (S/NFD) The main railroad/highway bridge over the Canal Des Rapides was interdicted on 12 August, but a rail bypass bridge remained serviceable. This bypass bridge was interdicted on 22 August, effectively stopping through rail traffic from Lao Cai and Dong Dang from reaching the Haiphong line and using the rail ferry bypass around the Doumer Bridge. Traffic from Haiphong via the bypass to Hanoi or south will not be affected by the interdiction of the Canal Des Rapides bypass.
- 5. (S/NFD) The combination of the interdiction of the Red River and the Canal Des Rapides Bridges and the MK 36 influence bombs at the rail ferry bypass over the Red River has resulted in the most serious disruption to the North Vietnamese rail system since the beginning of the ROLLING THUNDER Program. However, a highway pontoon bridge at each of the two Hanoi bridges plus highway ferries

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at the Doumer Bridge and a rail ferry at the Canal Des Rapides Bridge permit a continuation of a small amount of traffic.

- 6. (S/NFD) Recent strikes against rail facilities and equipment on the Hanoi-Dong Dang rail line in the sanctuary area along the Chinese border -- as far north as Lang Son, eight nautical miles from the Chinese border -- also have disrupted traffic from China. The original rail bridge and one rail bypass bridge at Lang Son were destroyed on 13 August, but one rail bypass bridge around Lang Son probably is still serviceable. In addition, a probable highway pontoon bridge is under construction. Large concentrations of rolling stock in this area were noted during the latter half of July -- probably indicating that rail equipment was being stored in the sanctuary area with train operations being intensified during hours of darkness. The cumulative effects of the attacks on bridges, yards, and sidings on the Hanoi-Dong Dang line during the reporting period may compel the North Vietnamese to make greater use of the less efficient highway net.
- 7. (S/NFD) The Hanoi-Haiphong line -- which was interdicted at the two rail bridges at Hai Duong on 21 June -- is probably operational for through rail service to the Doumer Bridge. The smaller bridge at Hai Duong, for which bypasses have not been completed, was restored prior to 1 July. The larger bridge remains interdicted, but serviceable bypasses permit through

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rail traffic to continue. The rail line south of Hanoi is closed for through rail service to Vinh. Shuttle service continues along major segments of this line, however, and pilots report small concentrations of freight cars and some locomotives at several yards and rail ferries. Aerial photography reveals several pieces of rolling stock as far south as Dong Tam close to the terminus of the tramway south of Vinh near the Rao Nay River, a key water transshipment point.

- 8. (S/NFD) The Hanoi-Lao Cai line was kept operational for most of the period by using rail ferries at the Viet Tri Rail and Highway Bridge. Evidence of construction of repair activity was noted on this bridge for the first time since it was destroyed in June 1966. The detection of six new bypass bridges at vulnerable points along the Hanoi-Lao Cai line and reconstruction activity on the Viet Tri Bridge suggest that Hanoi plans to use the route more extensively in the future as an alternate rail connection with China.
- 9. (S/NFD) Although railroad lines were especially hard hit, with concentrated, simultaneous attacks against key facilities on each of the northern lines, the ability of the rail transport system to maintain the normal flow of traffic was not seriously affected until the destruction of the Doumer Bridge on 11 August. Destruction and damage of railroad freight cars and locomotives declined slightly from the June totals, but were much higher than in the previous months. Despite the heavy loss of railroad equipment, there continues to be no evidence of serious shortages. Aerial photography indicates that

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the number of available railroad cars in North Vietnam is at least 2,000, or about the same level as at the beginning of the bombing.

The destruction of freight cars has been offset by imports and possibly the use of Chinese rolling stocks. This inventory of rolling stock is adequate to meet North Vietnam's need despite the inefficient and time-consuming method of operations that are required.

- 10. (S/NFD) Air strikes against the road system declined during the reporting period and most major routes in the country are serviceable. The lower level of attacks against the highway network and less rainfall permitted the North Vietnamese to improve the condition of the important roads. Repair efforts and bypass facilities kept the routes open for truck movement and the level of traffic remained high, especially in the Panhandle south of the 20° Parallel. A greater volume of trucking has been needed to support the increase of North Vietnamese troop strength and the higher level of military activity in the DMZ area. Trucking in the northwest, especially on Route 6, reflected the continued flow of supplies through that region.
- 11. (S/NFD) Monthly vehicle losses continued to increase and the number reported destroyed, and damaged during the period was one of the highest monthly totals since the beginning of the ROLLING THUNDER Program. The preponderance of strikes and damage to vehicles occurred in the Panhandle south of the 20° Parallel. A greater percentage of strikes against trucks were flown at night when the highest number of vehicle movements took place.

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- 12. (S/NFD) Recent construction activity showed continuing improvements in highway bridge repair and bypass techniques. A new type of stream crossing in North Vietnam was detected on principal roads in the northeast leading to China. The structures feature massive earth and rock-filled pier or causeway sections clad with masonry or concrete and linked by concrete deck sections spanning up to six water gaps or passageways. These novel structures have been installed as bypasses to bridges and as replacements for ferry bottlenecks.
- 13. (S/NFD) Reported damage to watercraft declined for the second consecutive month but still continued at a high level. Most attacks were against craft on inland waterways, particularly concentrations in the Red River Delta, the southern Panhandle, and the northern portion of the intracoastal route near Thanh Hoa. Small craft continued to be sighted in the vicinity of mined areas in the south, but no large self-propelled, metal-hulled craft have been detected in those waterways to which access is only possible through mined areas. In other air actions against waterways, damage was inflicted on cargo-handling facilities, supply areas, and piers. No strikes against maritime port facilities were conducted. The naval base at Port Wallut was struck on 21 August. Pilots reported inflicting damage on buildings and a pier with numerous secondary explosions resulting.
- 14. (S/NFD) North Vietnamese Air Force reactions remained at a low level -- partly because of poor flying weather over the MIG bases -- but there was a resurgence of SAM activity. Air engagements between 19 July and 22 August resulted in the loss of five MIGs with no US aircraft lost.

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Two US aircraft were lost over China after inadvertently crossing the border. The number of SAMs fired during the same period increased to 279; five US aircraft were downed by SAMs. Newly discovered SAM sites in the northwest suggest that the North Vietnamese are attempting to establish a barrier defense against US aircraft staging from Thailand. The North Vietnamese also persisted in their efforts to maintain a SAM threat in the DMZ area, although there were no missile launches during the period.

- 15. (S/NFD) The information provided by a captured North Vietnamese Army corporal supports the judgment that to date the Chinese Communist military effort in North Vietnam appears to be one of logistical support. It is estimated that the Chinese Communist military personnel now in North Vietnam are assigned to AAA, railway-engineer, security, headquarters, and support units. The primary role of the AAA is the protection of Chinese construction units. There are no reliable indications of the presence of Chinese ground combat units.
- 16. (S/NFD) Attacks against key facilities on the LOCs have created major problems in the distribution of military and economic supplies. Disruption and dislocation of normal transportation patterns have caused additional delays and greater use of less efficient modes of transport. The cumulative effects of the air

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strikes have degraded North Vietnam's capability for sustained large-scale conventional military operations against South Vietnam. However, the North Vietnamese still retain the capability to support activities in South Vietnam and Laos at present or increased combat levels and force structures.

#### Leadership and Public Reactions

- 17. (S/NFD) The 20 July anniversary of the 1954 Geneva agreements and of Ho Chi Minh's tough and unyielding statement on the war made last year on 17 July afforded the Hanoi leadership another opportunity to underscore its opposition to any settlement of the conflict not in keeping with Communist demands. Propaganda statements made on the occasion of the two anniversaries and private statements during the past month gave no sign that the regime has altered its determination to carry on the struggle despite the growing hardships of the general population and the increased physical destruction the recently intensified bombings have wrought.
- 18. (S/NFD) There continue to be no signs of open disaffection with the regime despite the difficulties incurred by the population both in urban areas and in the countryside, nor has there been any indication that the regime is modifying its policies in response to any popular unrest. Letters from residents of North Vietnam continue to reflect a resigned acceptance of the hardships inflicted by the bombings.

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#### Effects on the Economy

- 19. (S/NFD) The most significant effects of the bombing on the economy of North Vietnam during the reporting period resulted from attacks on key bridges which have made the transportation of goods more difficult and costly. Little additional damage was inflicted on industrial facilities. Most modern industrial facilities already had been damaged, destroyed, or rendered inoperative by lack of electric power. Bomb damage and loss of electric power will prevent the production of pig iron and cement from being resumed in the foreseeable future. In Hanoi, production has decreased substantially because of electric power shortages and the dispersal program. In addition, industrial output in Nam Dinh, Viet Tri, and Phu Tho has been disrupted by power shortages, bomb damage, and dispersal of facilities.
- 20. (S/NFD) The principal effects of the attacks on industrial facilities have been the loss of current and future output of the small modern industry, greatly reduced exports, and lower foreign exchange earnings. Manufactured consumer goods, primarily produced in local or handicraft industries, are still available to meet the essential requirements of the population. Greater emphasis is being placed on these industries to counter the effects of the bombing. Aid from Communist countries is increasingly helping to sustain the economy.

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- 21. (S/NFD) About 80 per cent of the total electric generating capacity is currently out of operation. All of the central generating plants in the main Hanoi-Haiphong network have been out of service since the end of April with the exception of the Uong Bi and Hanoi powerplants. Uong Bi was restored to partial operation for a short time during late May or early June, at which time it was restruck and put out of service. The Hanoi powerplant was restruck on 21 August; although damage to generating units was inflicted, the plant probably can be operational at about one-half its installed capacity within one week. Photography of mid-July revealed evidence of attempts to repair damage to the Hanoi plant, but it is believed to have been operating at no more than three-fourths of its installed capacity at the time of the 21 August strike. Additional damage to the Thai Nguyen and Ben Thuy powerplants -resulting from restrikes in the last half of July -- was sufficient to prevent partial operation of these facilities for at least three months. Information is not available to evaluate the damage inflicted by attacks in August on the Thai Nguyen and Ben Thuy powerplants.
- 22. (S/NFD) Communist countries continue to make commitments to support North Vietnam with technical and economic aid. A contract for a steel rolling mill was signed with East Germany in July. The size of the mill, when construction is to begin, or where the mill is to be located was not announced; however, if construction is to begin in the near future, the mill would probably be of limited size and not connected with the Thai Nguyen complex. Technical and

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economic aid agreements with Communist China and North Korea were signed in August. An official visit to Poland in July suggests that Poland will continue to furnish North Vietnam with small-scale industrial plants.

- temporarily improved by the rice crop harvested in June and July, although the food situation in the long-run remains bleak. This rice crop (normally about one-third of the annual harvest) is tentatively estimated at about 1.4 million metric tons or about 200,000 metric tons below the average in recent years. In addition to the disruptive influence of the bombing, the shortfall was partly caused by a cold spell which delayed transplanting and contributed to a reduction in the acreage planted. It is too early to evaluate the final prospects of the rice crop to be harvested in October and November (normally about two-thirds of the annual harvest), but the crop already has suffered from drought during transplanting in July and undoubtedly will continue to suffer from the effects of the bombing.
- 24. (S/NFD) There was no significant destruction of petroleum storage facilities or petroleum during the reporting period. Observed imports of petroleum in July amounted to about 14,700 metric tons, with estimated consumption at about 19,000 metric tons. Although imports were higher than the

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low level observed in June (11,000 metric tons), they remained well below the high monthly average observed during December-May (about 26,000 metric tons). The decrease in imports during June-July probably reflects the full utilization of existing storage capacity, resulting from the earlier high level of imports and the increase in stocks. Stocks as of 31 July are estimated to have been at least 75,000 metric tons, equivalent to almost 120 days of supply at the rate of consumption estimated for July.\*

25. (S/NFD) Identified seaborne imports in July were at a nine month low of 72,000 metric tons, 5,000 metric tons less than the monthly average for 1966 and about half the June volume.

Most of the decrease was in imports of foodstuffs, fertilizer, and miscellaneous general cargoes. Haiphong remained congested, however, and the lengthy delays in off-loading ships in port experienced in June continued during July. Extraordinary delays in unloading tankers ranged from 30 days to an expected 50 days. In addition, a large tanker from the Black Sea apparently was

<sup>\*</sup> Approximately 15,000 metric tons of petroleum shipped from China in 1967 may have consisted of supplies diverted to China in mid-1966 which were considered to have been transshipped by the end of 1966. If so, the estimated stocks on hand would amount to about 60,000 metric tons, or about 95 days of supply.

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diverted to China and at least two small tanker shipments from Vladivostok were cancelled during June and July. Freighters departing Haiphong in July had, on the average, experienced the longest delays since the bombing began. The average time in port for these ships reached 25 days compared with an average of 13 days during 1966 and 12 days during January-April 1967.

- 26. (S/NFD) North Vietnam has increased its use of lighters to alleviate the congestion, but the increase has not been sufficient to meet the current heavy demands. Because of backlogs, even longer delays may be recorded for ships that depart in August. The sharp drop in ship arrivals and seaborne imports in July should enable the North Vietnamese to reduce the backlog of ships awaiting unloading.
- 27. (S/NFD) Identified seaborne exports during July fell to the lowest level (34,200 metric tons) since the bombing began.

  No seaborne exports of apatite, pig iron, or cement were detected. In fact, loss of cement production at Haiphong necessitated the import of at least 2,000 metric tons of cement from China to meet domestic requirements. Coal shipments, however, increased slightly over the record low volumes of May and June. Shipments of coal from Hon Gai were well above the average for the previous 12 months but shipments from Cam Pha decreased for the sixth successive month, probably because of bomb damage inflicted on the coal processing plant at that port sometime after mid-February.

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28. (S/NFD) Cumulative measurable damage attributable to the ROLLING THUNDER program through July is estimated at \$321 million (see Tab B). Much of the additional cost estimated during July actually resulted from damage inflicted in previous months -- such as losses in agricultural production. The shortfall in the rice crop harvested in June and July is tentatively estimated at \$17 million. In addition to the measurable losses, there continue to be many other losses to the economy and to the military establishment which cannot be assigned meaningful values.

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RESULTS OF STRIKES ON NVN TARGETS  $\frac{a}{}$  THRU 16 AUG 67 TABLE 360

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	Total Targets <u>c</u> /			Targets Struck		<u>e</u> /	<u>b</u> /	% of National		
Fixed Targets	National Capacity (X 1000)	JCS <u>d</u> / Targeted		<u>d</u> /		No. of Attacks	Strike Sorties	Capacity Destroyed or inactive because		
	(X 1000)	No.	%	No.	%			of air		
Barracks	443 men	65	41.08	55	33.4	369	3006	25.60		
Ammo Depots	112.6 MT	18	100	18	100	107	1373	76.5		
POL Storage *	133.5 MT	13	100	13	100	87	714	86.6		
Supply Depots	10550 SqFt	29	42.48	23	44.4	84	847	18.51		
Power Plants	_187 KW	20	94.5	14	76.1	93	733	80		
Maritime Ports	7.8 ST/Dy	8	95	6	44	28	236	13.4		
RR Yards	33.7 ST/Dy	4	78	3	54	75	458	23.0		
RR Shops		3	88	2	68	5	38	21.6		
<u>Industrial</u> :										
Explosive Plt	1 MT	1	100	1	100	17	110	100		
Iron & Steel	300 MT (PIG	) 1	100	1	100	23	273	100		
Cement Plant	600 MT	1	100	1	100	1	57	90		
<u>Airfields</u>	32	12*	*	7*	* 36	55	766	23		
Naval Bases	9	5		3	42	26	232	19.5		
Bridges	1517	61		52		469	3643	51.3(of	those	tgtd
Commo Install	50	5		2		2	15	20		
Radar Sites	210	5		5		74	434	37.5		
SAM Sites	164			58		12	388		*	
Locks & Dams	94	8		2	10.6	2	10	5.3		
<u>Ferries</u>	160			11		7	44			

\* JCS targets only; does not include dispersed storage.

\*\* Includes non-JCS numbered

Hoa Lac Airfield.

Armed Recce Sorties 157,530

Destroyed Damaged Vessels 8,050 14,320 5,183 Vehicles 4,505 RR Stock 1,555 2,398

Total Sorties: 13,376

- $\underline{a}/$  Assessments are based on best information received, will be refined as more accurate information becomes available.
- $\underline{b}/$  Strike plus flak suppression sorties. Some applied to multiple targets; in this summary assigned to principal target.
- $\underline{c}/$  These columns are not additive, since the number of installations, both targeted and struck in some cases, apply to more than one category of targets (i.e., barracks, supply and ammo depots).
- $\underline{d}$ / Percentages of national capacity where appropriate.
- $\frac{e}{f}$  Also numerous attacks during armed recce and other missions.  $\frac{e}{f}$  Also numerous installations, AA sites, bridges, etc., attacked and road and rail cuts made.

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Value of Economic and Military Damage Attributed to the ROLLING THUNDER Program 1965 Through July 1967

#### Economic

#### Military

Direct Losses	Million US\$	Direct Losses Million U	JS\$
Railroad/Highway Bridges	$28.3\frac{a}{b}$	Barracks 28.2ª	′
Transportation Equipment	59.1	Ammunition Depots 5.2a	
Electric Power Plants	27.3ª/	Motor Vehicle and	
Petroleum	7.4	Supply Depots 7.3ª/ Airfields 0.9ª/	
Manufacturing Facilities	17.5	Airfields 0.9a/	,
Railroad Yards	5.7 <u>a</u> /	Radar and Communications	
Maritime Ports	1.4	Sites 2.8	,
Miscellaneous Armed		SAM Sites 5.0 <sup>a</sup> /	
Reconnaissance	1.9	Naval Bases 1.6	
		Aircraft 30.8	
SUBTOTAL, Direct Losses	148.6	Naval Craft 4.6	
		Miscellaneous Armed	
Indirect Losses		Reconnaissance 10.0	
Exportsc/	25.4	TOTAL, Direct Losses 96.4	
Agriculture <u>d</u> /	42.5		
Fishing	8.3	TOTAL	
		Million US\$	
SUBTOTAL, Indirect Losses	76.2		
		Economic 225	
TOTAL, Direct and Indirect	224.8	Military 96,	
		TOTAL $\frac{321e}{}$	

a/ Estimate is incomplete because of inadequate post-strike photography.

 $<sup>\</sup>underline{b}/$  Of the total, \$5.0 million is estimated to have been expended to date on the repair of damaged and destroyed bridges and \$23.3 million is estimated for complete restoration in the future of bridges damaged or destroyed. In addition, \$1.4 million would be required to make temporary repairs to presently unrepaired bridges.

 $<sup>\</sup>underline{c}/$  Including imports of cement necessitated by the loss of production at the Haiphong Cement Plant.

d/ It should be noted that losses of agricultural crops are arbitrarily attributed entirely to the indirect effects of the bombing. An unknown part of these losses is in fact due to weather and other natural causes.

Excluding the cost of trucks destroyed and damaged in Laos and economic and military facilities and equipment destroyed and damaged by US naval operations along the coast of southern North Vietnam.

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AP-4
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                                                                                                                                                                                        AP-4A2 (Pent)
AP-4A2 (AHS)
AP-4B4
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Approved For Release 2002/05/29: BIE-RGF 82:50205806000000000007-1